1997 Edition

Flammable Liquid Users Manual

Regulatory Compliance for Tennessee's Flammable Liquid Users (FLUs)

SPONSORED BY:

The Tennessee Department of Environment and Conservation

and

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INTRODUCTION
About This Manual

Flammable liquid users (FLUs) in Tennessee must obey a regulatory continuum enforced, as appropriate, by the Department of Safety (TDOT), the Department of Labor's Division of Occupational Safety and Health (TOSHA), and the Department of Environment and Conservation (TDEC). This continuum in some cases consists of more than 20 regulations.

Typically a regulation seeks to achieve its goals by exerting "administrative" and/or "engineering" controls. Administrative controls require on-going action such as employee training, written plans and procedures, monitoring, and record keeping. In contrast, engineering controls, while applying continuously, affect only the one-time decisions associated with the design, selection, and installation of equipment. This manual focuses on administrative controls and in most cases omits regulations engineering control elements.

The University of Tennessee Center for Industrial Services (CIS) prepared this manual to provide:

- a summary of the regulations which may affect an operation solely because it uses one or more flammable or combustible liquids.
- an answer to "How does this regulation affect me?"
- key details of "administrative control" duties required by such regulations, and
- useful internet resources.

Guidance provided in the manual represents an elaboration of elements extracted from current regulations. Most of these regulations have changed little in several years. But, regulations do change, which could invalidate this guidance. Moreover, although we believe this information to be accurate, no reader should assume it replaces published regulations.

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SECTION ONE
An Overview of Regulations Affecting FLUs

How Do The Regulations Define "*Flammable Liquid*"?

DOT, EPA, OSHA, and CIS (for this manual's purposes) define "*flammable liquid*" differently.

- DOT's Class 3 (Flammable Liquid) definition includes all liquids having a flashpoint of 141°F or less.
- EPA's waste regulations don't use the term flammable liquid. They use the term "*Ignitable Characteristic*" hazardous waste for those materials with flashpoints lower than 140°F. EPA also specifically lists most common flammable liquid solvents, as either F003 or F005 hazardous wastes, when they are spent.
- OSHA defines flammable liquids as those having a flashpoint less than 100°F, but then also defines liquids having flashpoints between 100°F and 140°F as "*Class 2 combustible liquids.*"
- CIS defines all liquids with a flashpoint of 140°F or less as flammable, whether waste, reclaimed mixture, or pure. We expect definition differences to have little effect upon FLUs following the manual's guidance, particularly if they use relatively common flammable liquids; *i.e.*, acetone, cellusolve, methanol, MEK, naphtha safety solvent (often called mineral spirits), styrene, toluene, or xylene, all of which have flashpoints below 110°F.

What Regulations May Affect The Operations of FLUs?

- Unloading a flammable liquid shipment triggers DOT's HAZMAT training rule 49 CFR 172.700, which the Tennessee Department of Safety enforces without change.
- On-site storage, handling, or use of flammable liquids may trigger elements of many OSHA rules, which The Tennessee Department of Labor Division of Occupational Safety and Health (TOSHA) enforces as written. Among them are:

29 CFR 1910.38	Fire prevention plan
29 CFR 1910.94	Ventilation
29 CFR 1910.106	Flammable and combustible liquids.
29 CFR 1910.107	Spray finishing using flammable and combustible liquids.
29 CFR 1910.108	Dip tanks containing flammable or combustible liquids.
29 CFR 1910.119	Process safety management of highly hazardous chemicals.
29 CFR 1910.120	Hazardous waste operations and emergency response.
29 CFR 1910	Subpart I - Personal Protective Equipment
29 CFR 1910	Subpart J - General Environmental Controls.
29 CFR 1910	Subpart L - Fire Protection
29 CFR 1910.178	Powered Industrial Trucks
29 CFR 1910.307	Electrical Installations, Hazardous (classified) locations.

- FLU operations expose personnel to toxic vapors. TOSHA also enforces 29 CFR 1910.1000 - Air Contaminants, but they enforce the more restrictive Table Z-1-A exposure limit values

OSHA published at 54 FR 2920-2983. TOSHA did not adopt OSHA's revocation of those values.

- Employee exposure to flammable liquids triggers Tennessee's Hazardous Chemical Right to Know rules at Chapter 0800-1-9. This rule, which enlarges OSHA's Hazard Communication Standard, 29 CFR 1910.1200, also is enforced by TOSHA.
- Vapor emissions from FLU facilities may be regulated by the Tennessee Department of Environment and Conservation (TDEC) Division of Air Pollution Control (APC). These regulations may be found at Chapter 1200-3. Facilities located in Davidson, Hamilton, Knox, or Shelby counties are regulated locally.
- Wastewaters contaminated with a flammable liquid may be regulated by TDEC's Division of Water Pollution Control (WPC). Their regulations may be found at Chapter 1200-4. However, in most cases the publicly-owned treatment works receiving an FLU's wastewaters establishes applicable discharge limitations.
- Most waste flammable liquids and materials contaminated with flammable liquids meet criteria defining them to be hazardous wastes. TDEC's Division of Solid Waste Management (SWM) enforces rules applicable to storing, handling, and disposal of hazardous wastes. These regulations, found at Chapter 1200-1, adopt all of EPA's hazardous waste rules, 40 CFR Parts 260 through 272, by reference.
- The handling, and labeling of hazardous wastes for off-site transport once again brings DOT's 49 CFR 172.700 HAZMAT employee rule into effect. In some cases, the rules applying to hazardous waste operations and emergency response, 29 CFR 1910.120 also may apply.

SECTION TWO
Training HAZMAT Employees
DOT 49 CFR 172.700

How Does This Rule Affect FLUs?

DOT's hazmat (hazardous material) definition includes flammable liquids and wastes. By DOT definition, FLUs are ***hazmat employers***. DOT requires a hazmat employer to train its ***hazmat employees*** and to *certify* they received training and were tested in various aspects of transportation safety.

What Aspects of Flammable Liquid (FL) Handling Does This Rule Cover?

The rule covers those FLU (hazmat) employees performing the following tasks:

a) Loading, unloading, or handling of FL shipments.
b) Providing the "*Shipper's Certification*" for a FL shipment. This document certifies a hazmat shipment to be in proper condition for transport according to applicable DOT regulations; a requirement for off-site shipment of hazardous waste.

What Administrative Actions Does This Rule Require a FLU To Take?

FLUs must:

1. Provide a systematic training program for hazmat employees, which includes:
   a) General awareness/familiarization training enabling employees to recognize and identify hazardous materials.
   b) Function-specific training concerning DOT requirements specifically applicable to functions performed by the employee.
   c) Safety training including:
      i) Site and material specific emergency response information,
      ii) Measures to protect employee from workplace exposure to hazardous materials being handled,
      iii) Measures the employer has in place to protect the employee from such exposures,
      iv) Methods and procedures for avoiding accidents.
2. Complete the training of untrained hazmat employees within 90 days and until they're trained make certain they perform their functions under the direct supervision of a trained employee.
3. Retrain all trained hazmat employees at least every three years.
4. Keep a current training record for each hazmat employee. It must show hazmat training given the employee during the past three years and include:
   a) The hazmat employees name.
   b) The completion date of the employees most recent hazmat training.
   c) A description, copy, or location of the training materials used.
   d) The name and address of the person(s) providing the training.
   e) Your written *certification* that the hazmat employee has been trained and tested as required.
5. Keep training records on ex-hazmat employees for at least 90 days following their termination.

SECTION THREE
Employee Emergency Plans & Fire Prevention Plans
OSHA 29 CFR 1910.38

How Does This Rule Affect FLUs?

This rule applies to all employers, but FLUs have an increased potential for fire and toxic chemical release.

What Aspects of Flammable Liquid (FL) Handling Does This Rule Cover?

Emergency action plans address reasonably anticipated emergency situations. They designate who does what, how, and when during such emergencies. Use of a FL may affect the facilities emergency evacuation plans, response procedures, medical and rescue requisites, etc.

What Administrative Actions Does This Rule Require a FLU To Take?

1. FLUs with more than ten employees must have ***written*** emergency action and fire protection plans, keep them in the workplace and make them available for employee review. FLUs with fewer than 10 employees also must have these plans, but they need not be written. Paragraphs (a)(2) and (b)(2) cite minimum elements of these plans.
2. A FLUs fire prevention plan must be enlarged beyond minimum requirements to include:
   a) procedures used to properly store and handle the FL.
   b) supervisory and maintenance procedures used for control of potential ignition sources.
   c) specific fire protection equipment needed to control fires involving the FL.
   d) procedures to control accumulation of flammable wastes and residues.

SECTION FOUR
Ventilation
OSHA 29 CFR 1910.94

How Does This Rule Affect FLUs?

FLUs often cleanse and finish, or strip parts using open surface tanks and spray finishing processes. The ventilation rule covers all abrasive blasting, grinding, polishing, buffing, or spray finishing operations and operations involving the immersion of materials in liquids or vapors of liquids held by open surface tanks.

What Aspects of Flammable Liquid (FL) Handling Does This Rule Cover?

- Paragraph (c) covers ventilation requirements for booths and rooms used for spray finishing operations. Many coating materials applied by spray finishing are FLs.
- Paragraph (d) covers ventilation requirements for open surface tanks. FLs often are used in open surface tanks; e.g., degreasing, dip coating, or stripping.

What Administrative Actions Does Paragraph (c) Require a FLU To Take?

FLUs must:

1. Conduct all production spray finishing operations in a spray booth or spray room designed, constructed, and operated per 29 CFR 1910.107.
2. Monitor the pressure drop across overspray filters. Maintain spray booth air flow velocity at a minimum of 100 fpm, preferably about 150 fpm, by replacing or cleaning overspray filters when pressure drop gets too high.
3. Provide spray booth operators who must position themselves downstream of the object being sprayed with an air supplied, or other suitable, respirator.
4. Provide make-up air heated to at least 65^{o}F, or safe radiant heat for operators, whenever outdoor temperatures remain below 55^{o}F.

What Administrative Actions Does Paragraph (d) Require A FLU To Take?

FLUs must make certain:

1. Open surface tank ventilation reduces employee air contaminant exposure to the appropriate permissible exposure concentration limit (PEL), usually a time-weighted average (TWA) or short-term exposure limit (STEL).

   Note 1: TOSHA enforces the more restrictive 29 CFR 1910.1000 PELs OSHA specified, but later rescinded, at 54 FR 2920-2983.

Note 2: FLUs should conduct employee exposure tests to verify attainment of this requirement and keep complete records of all such tests. That is, when the test was made, who was tested, at what production level, who did the testing, the static pressure of exhaust hooding when tests were conducted, test results, etc.

2. The exhaust system for an open surface tank achieves airflow requirements appropriate to the hazard classification of the materials in use. Those containing most common FL's must achieve flow for a Type B-2 hazard classification.

3. The hood static pressure coinciding with required exhaust hood airflow is measured and recorded when the exhaust system is first operated. Thereafter, you must monitor and maintain that static pressure to assure proper exhaust system operation.

   Note: Monitoring results should be recorded.

4. Tank operators know about the hazards associated with the job, first aid procedures applicable to these hazards, and personal protection equipment requisites.

   Note: This is function-specific training, but it can be made part of training done to comply with 29 CFR 1910.1200 (Hazard communication) by incorporating it into the written program required by that standard.

5. Tank operators have been provided with personal protection equipment appropriate to the hazards associated with the operation.
   a) Boots or shoes, if feet can get wet.
   b) Gloves, if hands get wet.
   c) Aprons, coats, jackets, if clothes get wet.
   d) Chemical goggles, if splashing occurs.
   e) Lockers to prevent contamination of street clothing.
   f) Deluge shower and eye wash station.
   g) Readily available first aid facilities.
   h) Wash-up facilities, including soap, towels, and hot water.
   i) Emergency respirators.

6. An operator's sores, burns, or other skin lesions serve as a reason for job reassignment, unless a physician authorizes continued work at the open surface tank.

SECTION FIVE
Flammable & Combustible Liquids
OSHA 29 CFR 1910.106

How Does This Rule Affect FLUs?

This rule applies to all employers storing or using flammable and combustible liquids. By definition, it affects all FLUs.

What Aspects of Flammable Liquid (FL) Handling Does This Rule Cover?

- Paragraph (b) covers FL storage in tanks, including tank design and construction, and tank installation above ground, underground, and in buildings.
- Paragraph (c) covers the design (including materials selection), installation and testing of FL piping and valve systems.
- Paragraph (d) covers the design, construction, and capacity of FL containers and portable storage tanks, the design, construction, and capacity of FL storage cabinets, inside storage rooms, and storage buildings, and specifies limitations on FL storage outside of buildings.
- Paragraph (e) covers industrial plants where FL use is either incidental to the principal business or confined to unit physical operations.

Note 1: This paragraph applies to the operations of most FLUs. Uses incidental to the principal business include operations such as spray coating in automotive and furniture manufacturing plants. Physical operations, such as distillation, filtering, or mixing, do not involve a chemical reaction.

Note 2: Requirements for tanks, piping and containers specified by paragraphs (b), (c), and (d) are incorporated into (e) by reference.

- Remaining paragraphs of Section 106 cover specific types of facilities; that is, (f) bulk plants, (g) service stations, (h) processing plants, and (I) refineries, chemical plants, and distilleries.

Note: Paragraph (h) seems to cover FLUs who use a chemical reaction to make fiberglass-reinforced styrene plastic products, but TOSHA regulates such operations in accordance with paragraph (e).

What Actions Does Paragraph (e) Require a FLU To Take?

FLUs must:

1. Determine the classification associated with the FL you use. FLs most commonly used in industry have flashpoints below 73°F and boiling points above 100°F, placing them in Class IB. ***This manual gives duties for users of Class IB liquids, which satisfies requirements for all classes but Class IA.***
2. Limit the size of FL storage containers as follows:
   a) Glass containers, 1 quart

b) Metal containers and safety cans, 5 gallons
c) Metal drums (DOT specs.), 60 gallons
d) Approved portable tanks, 660 gallons

3. Handle FLs safely. Make certain your employees:
   a) Keep FLs stored in tanks or in covered containers kept closed when not in use.
   b) Don't dispense FLs into containers unless the nozzle and container are electrically interconnected.
   c) Transfer FLs through a closed piping system using an approved pump drawing from the top OR by gravity through an approved self-closing valve.
   d) Use FLs only where no open flames or sources of ignition are in the path of vapor travel.
   e) Don't smoke in FL storage or use areas.
   f) Don't stack containers with more than 30 gallons capacity one upon the other.
   g) Maintain aisles at least 3 feet wide in all storage areas and don't block aisles or exits.
   h) Clean up spills promptly.
   i) Keep combustible waste materials and residues to a minimum, store them in covered metal containers, and dispose of them properly.

4. Limit to 120 gallons the FL stored outside approved storage (a cabinet or room) in any one fire area of a building. Locate portable fire extinguishers, one or more with at least a 12B rating, not less than 10 or more than 25 feet from such areas.

   Note: TOSHA doesn't define fire area, but NFPA 30 considers areas separated from the remainder of the building by walls and door opening assemblies having at least 1 hour fire resistance to be fire areas.

5. Limit to 60 gallons the FL stored in an approved storage cabinet. Do not group more than 3 cabinets in any one fire area unless the additional cabinet or grouping is at least 100 feet away. Label each cabinet "Flammable - Keep Fire Away."

6. Limit the size of inside storage rooms having a two hour fire resistance rating to 500 square feet. Limit to 10 gallons per square foot the FL stored in such rooms if they have been equipped with an approved fire protection system. Limit the FL stored to 4 gallons per square foot when such rooms have no fire protection.

7. Limit the size of inside storage rooms having a one hour fire resistance rating to 150 square feet. Limit to 5 gallons per square foot the FL stored in such rooms if they have been equipped with an approved fire protection system. Limit the FL stored to 2 gallons per square foot when such rooms have no fire protection.

8. Construct inside storage rooms to assure:
   a) The room is liquid-tight where the walls join the floor.
   b) All openings to other rooms are provided with self-closing fire doors.
   c) All openings to other rooms are protected by one of the following:
      i) a noncombustible liquid-tight raised sill or ramp at least 4 inches high, OR
      ii) the storage room floor is at least 4 inches below the surrounding floor, OR
      iii) the room contains an open-grated trench draining to a safe location.
   d) The room has a complete change of air 6 times per hour.
   e) All electrical wiring, lighting, or other electrically-driven equipment meets Class I, Division 2 Hazardous Location standards.
   f) Locate portable fire extinguishers, at least one rated at 12B, outside the each storage room within

10 feet of the door opening.

9. Limit the amount stored adjacent to your building to 1100 gallons, about 20 drums, and make certain you:
   a) grade the storage area to drain away from the building OR surround it by a curb at least 6 inches high,
   b) protect the storage area against tampering or trespassers, and
   c) keep the storage area free of weeds, debris and combustible matter

   Note: Curbed areas also must be provided with means for draining any spill or water accumulations. Drains must be accessible for operation during an emergency and terminate in a safe location.

10. Limit the amount stored in any one pile to 2200 gallons and make certain:
    a) you keep each pile at least 10 feet away from any building,
    b) separate each pile from other piles by at least 5 feet,
    c) maintain the distance from all piles to your property line at 20 feet or more, and
    d) have a 12 foot wide fire fighting equipment access within 200 feet of all containers in the pile(s).

SECTION SIX
Spray Finishing Using Flammable & Combustible Liquids, OSHA 29 CFR 1910.107

How Does This Rule Affect FLUs?

This rule applies to all FLUs doing spray application of flammable or combustible materials; e.g., solvents, paints, organic peroxides, adhesives, powders.

What Aspects of Flammable Liquid (FL) Spraying Does This Rule Cover?

- Paragraphs (b), (c), (d), (f), and (j) of this rule cover the design and construction of spray booths and their ancillary electrical, ventilation, fire protection, and drying equipment.
- Paragraphs (h), (i), (k), (l), and (m) cover the special requirements for applying coatings electrostatically automatically or by hand, for automobile undercoatings, and for powder and dual component coatings.
- Administrative duties this rule requires derive chiefly from paragraph (e), FL storage and handling, and paragraph (g), operations and maintenance.

What Administrative Actions Does This Rule Require a FLU To Take?

FLUs must:

1. Confine all spraying, liquid transfer, and mixing operations to booths or rooms constructed in accordance with paragraphs (b), (c), (d), (e), and (f) of this rule.
2. Make certain ventilating fans run whenever spraying, transferring, or mixing FLs.
3. Limit the amount of FLs stored in the vicinity of spraying operations to one day's supply and don't use glass containers.

   Note: Storage in spray booths is outside approved storage. Consult 29 CFR 1910.106 for other storage and use requirements.
4. Post "*No Smoking*" signs in all spraying areas and storage rooms
5. Install portable fire extinguishers near all spraying areas.

   Note: The requirements of 29 CFR 1910.106 suggest that "near" means no closer than 10 feet and no further than 25 feet.
6. Inspect and test all pressure hose and couplings at "in-service maximum operating pressure." Replace any found to be leaking or damaged.
7. Monitor dry-booth overspray filter pressure drop. Replace or clean overspray filters as required to maintain booth air flow velocity at a minimum of 100 fpm.
8. All discarded overspray filters must be immediately removed from the booth to a safe well-detached

location or placed into a water-filled metal container for later disposal.

Note: TDEC's Division of Solid Waste regulates the disposal of overspray filters as "special" wastes.

9. Regularly inspect equipment grounding and bonding, container pressure gages, pressure relief valves, piping systems, sprinkler heads, extinguishers, and other safety-related equipment.

   Note: We suggest you keep a record of all inspection and monitoring activities.

10. Keep spraying areas clean and reasonably free of combustible residues.
    - Use non-sparking tools for cleaning.
    - Use covered metal waste cans for interim storage of residues and rags impregnated with FL's or finishing materials.
    - Materials held in waste cans must be disposed of at least daily.

    Note: TDEC's Solid Waste Division regulates the storage and disposal of these residues, many of which must be handled as hazardous wastes.

11. Clothing of spray finishing employees must be kept in metal lockers if left at the premises overnight.

SECTION SEVEN
Dip Tanks Containing Flammable Liquids
OSHA 29 CFR 1910.108

How Does This Rule Affect FLUs?

This rule applies to any FLU applying flammable or combustible liquids to articles by immersing them in such liquids.

What Aspects of Flammable Liquid (FL) Dip Coating Does This Rule Cover?

- Paragraphs (b), (c), (e), and (g) of this rule cover the design and construction of dip tanks and their ancillary electrical, ventilation, fire protection, and conveyor drying equipment.
- Paragraph (h) covers the requirements for special dip tank applications such as equipment for hardening, tempering, and electrostatic coating.
- Administrative duties this rule requires derive chiefly from paragraph (d), FL storage and handling, and paragraph (f), operations and maintenance.

What Administrative Actions Does This Rule Require a FLU To Take?

FLUs must:

1. Bond and ground the dip tank with the supply container if you use portable containers to resupply the dip tank.

   Note: Consult 29 CFR 1910.106 for other storage and use requirements.

2. Conduct periodic inspections or tests of the dip tank's equipment, including covers, overflow pipe inlet and discharge, bottom drain and valving, grounding connections, electrical wiring, ventilation, and fire protection system.

   Note: We suggest keeping a record of such inspections or tests and any resulting remedial action.

3. Use covered metal waste cans for interim storage of residues and rags impregnated with FL's or finishing materials. Materials held in waste cans must be disposed of at least daily or at the end of a shift.

   Note: TDEC's Solid Waste Division regulates the storage and disposal of these residues, classifying most as hazardous wastes. TDEC classifies nonhazardous wastes from these sources as "special wastes."

4. Post "*No Smoking*" signs and install portable fire extinguishers near all dip tanks.

SECTION EIGHT
Process Safety Management (PSM)
OSHA 29 CFR 1910.119

How Does This Rule Affect FLUs?

PSM applies to any FLU whose *process* involves a flammable liquid (FL) on site in one location, in a quantity of 10,000 pounds, or more. For this regulation, a *process* is any activity involving use, storage, manufacture, handling, or on-site movement of a FL.

PSM exempts hydrocarbon fuels stored for use solely as fuel. The exemption for FLs stored in atmospheric tanks and kept below their boiling point without chilling or refrigeration does not apply to most industrial processes. This exemption applies only to transfer operations such as those conducted by redistributors storing a FL for later transfer into tank trucks or portable containers.

Note that this rule doesn't cover 10,000 pounds of FLs stored in 55 gallon drums in an inside room because the drums are not "connected" to the process. However, such an amount stored in a tank is covered, even when the tank is "connected" to the process only momentarily by a hose.

What Aspects of Flammable Liquid (FL) Handling Does The PSM Rule Cover?

The PSM rule requires affected FLUs to address comprehensively all the risks that may be associated with FL storage, handling, and processing. It emphasizes the application of administrative rather than engineering controls to prevent or minimize the impact of FL releases.

What Administrative Actions Does the PSM Rule Require a FLU To Take?

Affected FLUs must:

1. Prepare a written plan of action for assuring employee participation in the risk management process.
2. Provide written process safety information, including data on:
   a) FL hazards (MSDS-type information),
   b) process technology (flow diagrams, operating parameters, etc.), and
   c) process equipment (construction materials, design, safety systems, etc.).
3. Conduct a process hazard analysis using a qualified team and addressing subjects such as process hazards, applicable administrative and engineering controls, effects of control failure on the facility and employees, etc.
4. Provide written:
   a) process operating procedures, annually certified to be current and accurate.
   b) procedures and inspection/test schedules for equipment maintenance.
   c) procedures for managing any change to the process or equipment operation.
   d) emergency action plans.
   e) procedures for pre-startup review of new facilities.

f) procedures for involving outside contractors and contract employees in the process safety management efforts of the facility.

5. Establish a written “hot work” permit program.
6. Keep employee training and retraining records, including means for assessing the frequency required for retraining and certification of an employee's ability to safely perform assigned tasks.
7. Conduct internal compliance audits at least once every three years.

SECTION NINE
Personal Protective Equipment
OSHA 29 CFR Subpart I (1910.132 to 1910.138)

How Does This Rule Affect FLUs?

FLUs having employees required to use personal protection equipment may be covered by the Subpart. It covers requirements for assessing employee exposure to hazards necessitating the use of personal protective equipment (PPE), selection of proper PPE, and employee training in proper use of the PPE.

What Aspects of Flammable Liquid (FL) Use Does This Subpart Cover?

- The use of FLs may result in the application of the following Subpart I sections:

1910.132	General requirements,
1910.133	Eye and face protection,
1910.134	Respiratory protection, and
1910.138	Hand protection.

- FLUs also may be affected by the following Subpart I sections, but for reasons not associated with FL use:

1910.135	Head protection,
1910.136	Foot protection, or
1910.137	Electrical protective equipment.

What Administrative Actions Does This Subpart Require a FLU To Take?

FLUs must:

1. Assess the workplace for the presence of hazards necessitating use of personal protective equipment (PPE) and provide written certification identifying the workplace assessed, who performed the assessment and when.
2. Select the types of PPE that will protect affected employees from identified hazards.
3. Require employees to use:
   a) eye protection when exposed to eye hazards from use of liquid chemicals or chemical vapors.
   b) hand protection when exposed to hazards from skin absorption of harmful substances.
   c) respiratory protection when no feasible engineering means can effectively control exposure to vapors or fumes.
4. Provide training to each employee required to use PPE which includes the following:
   a) When PPE use is required.
   b) What PPE must be used.
   c) How to properly use the PPE (don, doff, adjust, wear, clean, maintain, etc.)
   d) The PPE's limitations, its useful life, etc.

5. Verify via a written certification that each employee has received and understood all required training. The certification must name the employee, and give the date and subject of the training.
6. Have a written respiratory protection program respirator if your employees require respiratory protection. You must supply the required respirator and the program must cover its selection, use, care and maintenance.

SECTION TEN
General Environmental Controls
OSHA 29 CFR Subpart J (1910.141 to 1910.150)

How Does This Rule Affect FLUs?

Safety cans and warning signs used by FLUs may be affected by this subpart. It covers duties affecting a facility's general working environment.

What Aspects of Flammable Liquid (FL) Use Does This Subpart Cover?

- The use of FLs may result in the application of the following Subpart J sections:

1910.144	Safety color code for marking physical hazards.
1910.145	Specifications for accident prevention signs and tags.

- FLUs also may be affected by requirements in the following Subpart J sections, but for reasons not associated with FL use:

1910.141	Sanitation.
1910.146	Permit-required confined spaces.
1910.147	The control of hazardous energy (lockout/tagout).

What Administrative Actions Does This Subpart Require a FLU To Take?

FLUs must:

1. Use proper safety cans or other portable containers for FLs. They must be *red* and have some additional clearly visible identification painted or stenciled in *yellow*, such as a band around the can or the name of the contents.
2. Instruct employees that danger signs, such as the "Flammable - Keep Fire Away" signs required by 1910.106, indicate an immediate danger and require special precautions to be taken.
3. Make certain no in-plant variation exists in the type of sign design used to warn of specific dangers.

SECTION ELEVEN
Fire Protection
OSHA 29 CFR Subpart L (1910.155 to 1910.165)

How Does This Rule Affect FLUs?

FLUs with fire brigades and those using fire control systems may be affected. This subpart covers the organization, training, and outfitting of fire brigades whenever such groups are established by an employer. It also covers fire suppression, detection, or alarm systems installed to meet OSHA standards and those fixed fire suppression systems using extinguishing agents which may expose employees to harm.

What Aspects of Flammable Liquid (FL) Use Does This Subpart Cover?

- The use of FLs may result in application of the following sections:

1910.156	Fire brigades. This rule applies to FLUs that have established a fire brigade for handling emergency situations.
1910.157	Portable fire extinguishers. These duties were triggered by the section 1910.106 requirement to have a portable extinguisher near FL storage areas.
1910.159	Automatic sprinkler systems. These duties were triggered if you built a sprinkler protected room to store FL's in accordance with 1910.106.

- FLUs also may be affected by the following Subpart L sections, but for reasons not necessarily associated with FL use.

1910.158	Standpipe and hose systems.
1910.160	Fixed extinguishing systems, general.
1910.161	Fixed extinguishing systems, dry chemical.
1910.162	Fixed extinguishing systems, gaseous.
1910.163	Fixed extinguishing systems, water spray and foam.
1910.164	Fire detection systems.
1910.165	Employee alarm systems.

What Administrative Actions Does 1910.156 Require a FLU To Take?

FLUs with fire brigades must:

1. Train brigade members so they know the special hazards associated with storage and handling of those FLs to which they be exposed and the location where those FLs may be stored or used within the facility.

What Administrative Actions Does 1910.157 Require a FLU To Take?

FLUs must:

1. Visually inspect all portable fire extinguishers monthly.

Note: We suggest keeping a record of these inspections.

2. Conduct an annual maintenance inspection, record the inspection date and retain the record.
3. Perform hydrostatic testing at required intervals; maintaining a test certification record showing the test date, the signature of the person performing the test, and the serial number or other unique ID of the extinguisher. Required intervals are:
   a) every twelve years for most dry chemical or Halon filled extinguishers,
   b) every five years for all others, and
   c) whenever a visual inspection discloses corrosion or damage.
4. Train employees in the general principles of fire extinguisher use and the hazards involved with incipient stage fire fighting if you direct employees (or a special group of named employees) to use portable extinguishers per your emergency action and fire prevention plans (1910.38). This training must be done upon employment (or initial designation to the special group) and annually thereafter.

What Administrative Actions Does 1910.159 Require a FLU To Take?

FLUs using sprinkler systems must:

1. Maintain the sprinkler system and protect system piping against freezing, mechanical damage, and exterior corrosion.
2. Conduct an acceptance test and record the date of such testing on all newly installed facilities. The test should include all discharge or system supervisory alarms. The test must include:
   a) flushing of underground connections,
   b) hydrostatic tests of system piping,
   c) air tests in dry-pipe systems,
   d) dry-pipe valve operation, and
   e) testing of drainage facilities.
3. Conduct a main drain flow test annually.
4. Open the inspectors test valve at least once every two years.

SECTION TWELVE
Powered Industrial Trucks
OSHA 29 CFR 1910.178

How Does This Rule Affect FLUs?

This rule applies to all employers in general industry using specialized trucks powered by electric motors or internal combustion engines; such as, fork lifts, tractors, platform lifts, and motorized hand trucks. FLUs may be required to limit where they use their trucks.

How Does Use of Flammable Liquids (FLs) Affect Truck Usage?

- OSHA designates all operating areas where FLs may be stored, handled, or used as Class 1 hazard locations and forbids truck use in Class 1 areas unless the truck meets specific requirements for use in that area.
- Only a type EX truck (electric) meets OSHA's use requirements in locations where hazardous concentrations of flammable vapors may exist under normal operating conditions. These Class 1, Division 1, locations usually include areas where you:

  a) Transfer FLs from one container to another without adequate ventilation.
  b) Spray flammable materials (spray room and booth interiors).
  c) Dry articles sprayed with flammable materials.
  d) Use FLs in open tanks.

- Only trucks designated as Diesel DS and DY, Electrical ES, EE, and EX, Gasoline GS, and LP Gas LPS meet OSHA's use requirements in locations where you handle, process, or use FLs, but confine in closed containers or mechanically exhaust their vapors. These Class 1, Division 2, locations include adequately ventilated areas where you:

  a) Store and handle containers of FLs.
  b) Transfer FLs from one container to another
  c) Operate flammable material transfer pump systems.

What Administrative Actions Does This Rule Require a FLU To Take?

FLUs must make certain:

1. Trucks are approved for use in the locations where they are used.
2. All FL handling is done with hand trucks if you don't have a truck approved for Class 1, Division 2, locations.
3. All safety features remain functional when maintaining approved trucks.
4. No truck maintenance is performed in any location having a hazard classification; *i.e.*, Class I, II, or III.

SECTION THIRTEEN
Electrical Installations in Hazardous Locations
OSHA 29 CFR 1910.307

How Does This Rule Affect FLUs?

This rule applies to in-plant locations classed as hazardous because flammable vapors or liquids may be present.

How Does Use of Flammable Liquids (FLs) Affect Electrical Installations?

- OSHA designates all operating areas where FLs may be stored, handled, or used as *Class 1* hazard locations. Electrical equipment, wiring methods, and equipment installations must be either *intrinsically safe, approved for a specific* hazardous location, ***OR*** *safe for the location* in which they are used.

- Class 1, Division 1, locations usually include areas where FLUs:

  a) Transfer FLs from one container to another without adequate ventilation.
  b) Spray flammable materials (spray room and booth interiors).
  c) Dry articles sprayed with flammable materials.
  d) Use FLs in open tanks.

- Class 1, Division 2, locations include adequately ventilated areas where FLUs:

  a) Store and handle containers of FLs.
  b) Transfer FLs from one container to another.
  c) Operate flammable material transfer pump systems.

What Actions Does This Rule Require a FLU To Take?

FLUs can comply with this rule by using:

1. Equipment and associated wiring meeting NFPA 493-75; "Standard for Intrinsically Safe Apparatus for Use in Class I Hazardous Locations and Its Associated Apparatus" in any location for which it is approved. ***OR***

2. Equipment and wiring approved for use in a given hazard location if it is also approved for the properties of the specific vapors which may be present. Generally such equipment must be marked to show the class, group, and operating temperature (or temperature range) for which it is approved. The rule should be consulted for provisions modifying marking requirements.

3. Equipment and associated wiring safe for the location. Such articles must meet guidelines established in the National Electrical Code, NFPA 70 and you must be able to affirmatively demonstrate the installation provides protection from the hazard present in each specific location.

SECTION FOURTEEN
Toxic & Hazardous Substances
OSHA 29 CFR Subpart Z (1910.1000 thru 1910.1050)

How Does This Subpart Affect FLUs?

This subpart limits employee exposure to listed toxic and hazardous air contaminants. Most flammable liquids (FLs) generate toxic or hazardous vapors. TOSHA limits an employee's exposure to such vapors per 1910.1000 - Air contaminants, Table Z-1-A. TOSHA adopted these exposure limits once set forth by OSHA (54 FR 2920-2983) per Rule 0800-1-1-.1000, but did not adopt OSHA's later revocation of these limits.

What Actions Does This Rule Require a FLU To Take?

FLUs must:

1. Maintain employee exposure to vapors generated by FLs within Table Z-1-A, prescribed limits by use of engineering or administrative controls whenever feasible.

   Note: Engineering controls generally require use of mechanical ventilation. Administrative controls regulate employee exposure time.

2. Provide personal protective equipment (PPE) when engineering or administrative measures will not provide adequate protection. The PPE chosen must be approved for use with the contaminant in question by a technically qualified person

3. Make certain all PPE is in accordance with 1910.134 and other subpart I requisites.

4. Keep for 30 years and make available to employees in accordance with 1910.1020, all the results of monitoring or measurement of employee workplace air contaminant exposure and data relevant to interpretation of those results.

   Note: 1910.1020 was 1910.20.

SECTION FIFTEEN
Hazard Communication
OSHA 29 CFR 1910.1200

How Does This Rule Affect FLUs?

It requires employers to provide their employees information about the hazardous chemicals to which they are exposed. By definition flammable liquids are hazardous chemicals.

What Actions Does This Rule Require a FLU To Take?

FLUs must:

1. Assign responsibility for OSHA compliance management.
2. Make a list of all chemicals in the workplace by label identity.
3. Add to the list all chemicals you produce in the workplace.
4. Have on-site a current Material Safety Data Sheet for each listed chemical.
5. Determine which chemicals on the inventory are hazardous.
6. Make sure all containers are labeled, tagged, or marked. Proper labels show:
   a) Name of the hazardous chemical.
   b) Appropriate hazard, i.e. the specific organ affected by the chemical.
   c) Name and address of manufacturer.
7. Prepare a written Hazard Communication Program. Elements must include:
   a) Using, maintaining, and providing labeling and other forms of warning.
   b) Creating and maintaining the hazardous chemical lists and the Material Safety Data Sheet system.
   c) Providing employees training and information about workplace hazards.
   d) Hazards encountered performing non-routine tasks.
   e) Training provided for employees of outside contractors working on-site.
8. Annually train employees. Employees should be able to answer the following questions:
   a) What is this training about?
   b) What hazardous chemical(s) can you be exposed to during normal operations or in a foreseeable emergency?
   c) Where is this chemical present?
   d) What are the short and long term effects on the body?
   e) How can you detect if you are overexposed to the chemical(s)?
   f) How can you protect yourself from overexposure?
   g) Have the written program and MSDSs been explained to you?
9. Prepare a workplace chemical list using MSDSs. Although non-manufacturers list only items present in excess of specified amounts, facilities with an SIC in the range from 20 through 39 must list all such materials and include the following information:

a) Chemical/ component name.
b) Chemical Abstract Services (CAS) number.
c) Label identity.
d) Work area where chemical is normally used or stored.
e) Quantity code.

10. Submit the modified list to the local fire chief and to TOSHA by January 31 each year.

11. Placard the premises with proper NFPA 704M sign.

12. Prepare a written hazard determination program if you also manufacture or import chemicals.

Note: A 'What To Do Booklet' available from TOSHA area offices provides step-by-step guidance for developing this written program.

TOSHA Area Office Telephone Numbers

Chattanooga:	(423) 634-6424
Jackson	(901) 423-5641
Kingsport	(423) 224-2042
Knoxville	(423) 594-6180
Memphis	(901) 543-7259
Nashville	(615) 741-2795

SECTION SIXTEEN
Other OSHA Rules
OSHA 29 CFR 1910

How Do These Rules Affect FLUs?

OSHA regulates flammable liquids (FL) storage and/or use in standards associated with other hazardous materials or activities. FLUs who may use such materials or conduct such activities should know where these provisions exist.

What Other OSHA Rules May Affect FLUs?

1910.66	Powered platforms, manlifts, and vehicle-mounted work platforms. This rule forbids carrying FLs on these platforms.
1910.103	Hydrogen. This rule restricts proximity of FLs to hydrogen tank system and storage container locations.
1910.104	Oxygen. This rule restricts proximity of FLs to oxygen tank system and storage container locations.
1910.109	Explosives and blasting agents. This rule restricts proximity of FLs to explosive, blasting agent, and ammunition storage areas.
1910.110	Storage and handling of liquefied petroleum gases. This rule restricts proximity of FLs to LPG tank system and storage container locations.
1910.219	Mechanical power transmission apparatus. This rule requires consideration of sparking potential in the design of power transmission equipment destined for use in proximity to FL storage or use.
1910.265	Sawmills. This rule requires compliance with 1910.106.
1910.266	Logging operations. This rule forbids the transport of FLs in driver or passenger occupied areas of machines and vehicles.
1910.269	Electrical power generation, transmission, and distribution. This rule restricts access to areas where a FL is used, or could be produced by the chemicals used, to clean a boiler or pressure vessel.
1910.1028	Benzene. This rule restricts use and employee exposure to benzene, a Class 1B FL.
1910.1045	Acrylonitrile. This rule restricts use and employee exposure to acrylonitrile, a Class 1B FL.
1910.1047	Ethylene oxide. This rule restricts use and employee exposure to ethylene oxide, a Class 1B FL.

Note: OSHA's definition of LPG includes propane, butane, and isobutane.

SECTION SEVENTEEN
Air Pollution
TDEC Chapter 1200-3-1

How Do These Rules Affect FLUs?

Operations conducted by FLUs emit air polluting vapors. The vapors typically released consist primarily of materials classified by air pollution rules as volatile organic compounds (VOCs) or hazardous air pollutants (HAPs). Some solvents, such as toluene, 'count' in both columns.

What Aspects of Flammable Liquid (FL) Handling Do These Rules Cover?

- These rules indirectly limit the amount of FLs a facility may use in its processes.
- In most cases, FLUs with the potential to emit more than 15 pounds per day of VOCs, or 1000 pounds per year of HAPs, must secure permits to construct, modify, and/or operate their facilities.
- Permit restrictions can be more stringent on FLU facilities located in areas experiencing marginal control of ozone air quality standards.
- Permits for major sources, FLUs having the potential to emit 100 tons/year or more of VOCs, 10 tons/year or more of a single HAP, or 25 tons/year or more of HAPs in aggregate, can be even more restrictive. In some instances, control devices may be required to secure additional reduction in emissions.

What Administrative Actions Does This Rule Require a FLU To Take?

1. Most permits require you to keep records documenting VOC and HAP emissions for each calendar month. This requires you to record the amount of each VOC or HAP-containing material used during the month and its VOC and HAP content.
2. Permits for facilities emitting larger amounts or located in sensitive areas may require you to perform several additional duties, such as:
   a) preparing and maintaining a written work practice implementation plan.
   b) performing and recording planned maintenance and inspection duties.
   c) preparing and submitting routine compliance reports.

SECTION EIGHTEEN
Water Pollution
TDEC Chapter 1200-4-1

How Do These Rules Affect FLUs?

EPA designates or lists most flammable liquids (FLs) as hazardous substances, forbidding their unregulated direct discharge to the "Waters of the United States." TDEC's Chapter 1200-4-1 rules regulate the direct discharge of all waste waters in Tennessee, including any storm or process waste waters potentially polluted with FLs.

What Aspects of Flammable Liquid (FL) Handling Do These Rules Cover?

- A few processes using FLs generate waste water; *e.g.*, water-curtain spray booths. The direct discharge of process waste waters requires you to secure an individual National Pollutant Discharge Elimination System (NPDES) permit. Generally, these permits require applicants to install facilities for treating the waste waters. Securing this permit can be a time-consuming, wearisome procedure.

  If you discharge process waste waters to a Publicly Owned Treatment Works (POTW), you must meet the POTW's rules. They had to establish such rules in order to get their NPDES permit. TDEC does not permit process waste waters to be discharged to a septic system.

- A permit to discharge "storm water associated with industrial activity" covers the storm water exposed to industrial materials stored and handled outside, including wastes, raw materials, used equipment, and empty drums. The State of Tennessee secured an NPDES "Multi-sector General Permit For Industrial Activities" to cover affected industries in the state who would rather not seek an individual NPDES permit. You must provide TDEC with a Notice of Intent to be covered by this permit.

What Administrative Actions Do These Rules Require a FLU To Take?

1. An individual NPDES permit for direct discharge of treated process waste waters usually covers storm water discharges, too. These permits generally require:
   a) Analysis and reporting of analytical results on specified frequencies for influent and treated process waste waters and storm water discharges.
   b) Added duties such as scheduled maintenance of treatment unit equipment, operator certification and retraining, and generation and updating of pollution prevention plans.
   c) Record keeping on all required activities.
2. Coverage under TDEC's "Multi-Sector General Permit For Industrial Activities" requires:
   a) Performance of "universal" duties and duties specific to a facility's industrial sector, which include special monitoring and reporting and SWPPP requisites.
   b) Preparation and updating of a Storm Water Pollution Prevention Plan (SWPPP). SWPPP's provide facility management and site data and review housekeeping, maintenance, inspection and

other management practices adopted to minimize storm water pollution. A model SWPPP available from CIS provides guidance for this effort.

c) Annual training of affected employees.
d) Record keeping to validate performance of required activities.

SECTION NINETEEN
Emergency Planning & Community Right-to-Know 40 CFR Parts 302, 355, and 372

How Do These Rules Affect FLUs?

FLUs generally store some quantity of flammable liquids (FLs) on site. The Emergency Planning and Community Right-to-Know Act (EPCRA) requires all manufacturing facilities and many businesses to interact with governmental emergency planning or response groups when they work with listed chemicals in excess of a rule-specified quantity. EPA publishes a "List of Lists," identifying the chemicals subject to EPCRA requirements. Most FLs are named on these lists.

What Aspects of Flammable Liquid (FL) Handling Do These Rules Cover?

EPCRA requires a report to be made for three differing reasons, all relate to emergency planning or response. You must report specified types of information when:

- You accidentally release a listed FL to the environment in excess of a reportable quantity (RQ). Table 302.4 of 40 CFR 302 lists the RQ's for various elements, compounds, and hazardous wastes. The list below shows the RQ for several common FLs.

Flammable Liquid	RQ, pounds
Acetone	5000
Ethyl Acetate	5000
MEK	5000
Toluene	1000
Xylene	1000

- You store a listed FL on-site at any time a threshold planning quantity (TPQ), or more. A TPQ of 10,000 pounds applies to most common FLs. Appendix A to 40 CFR 355 lists the TPQ for 366 extremely hazardous substances (EHS). No common FLs are named on the EHS list.
- You manufacture, process, or use a listed FL in excess of a specified quantity. In most instances, FLUs trigger these reporting requirements when they "Otherwise Use" 10,000 pounds per year or more of a listed FL. Subpart D of 40 CFR 372 lists chemical substances subject to this requirement. All common FLs are listed except acetone. It was de-listed recently.

What Administrative Actions Do These Rules Require a FLU to Take?

1. As soon as you know about an accidental discharge from your facility that equals or exceeds an RQ,
   a) notify the National Response Center (NRC), U.S. Coast Guard, 2100 Second Street, SW., Washington, DC 20593, toll free telephone number (800) 424-8802 (in Washington, DC metropolitan area, (202) 267-2675). Also notify the Tennessee emergency response commission at (800) 262-3300 and the emergency coordinator for your local emergency planning committee.

i) *So long as no delay in notice or emergency response results*, your notice should include, to the extent known at the time of notice, the following information:

1) The chemical name or identity of any substance involved in the release.
2) An indication of whether the substance is an extremely hazardous substance.
3) An estimate of the quantity of any such substance that was released into the environment.
4) The time and duration of the release.
5) The medium or media into which the release occurred.
6) Any known or anticipated acute or chronic health risks associated with the emergency and, where appropriate, advice regarding medical attention necessary for exposed individuals.
7) Proper precautions to take as a result of the release, including evacuation (unless such information is readily available to the community emergency coordination pursuant to the emergency plan).
8) The names and telephone number of the person or persons to be contacted for further information.

b) As soon as practicable after a release you must provide a written emergency notice (or notices, as more information becomes available) following-up and updating the information listed above and including additional information with respect to:

i) Actions taken to respond to and contain the release,
ii) Any known or anticipated acute or chronic health risks associated with the release, and,
iii) Where appropriate, advice regarding medical attention necessary for exposed individuals.

2. Annually by March 1, you must file a Tier II report *if* you store on-site at any one time more than 10,000 pounds of any listed FL.

a) This report uses an EPA specified form and must be sent to:

i) Tennessee Emergency Management Agency
3401 Sidco Drive
Nashville, TN 37204
ii) Your "Local Emergency Planning Committee," and
iii) Your local fire department.

b) A Tier II report includes the following information:

i) Facility Identification
ii) Owner/Operator Name
iii) Emergency Facility Contacts
iv) Reporting Period
v) Chemical Description Information (CAS #)
vi) Physical and Health Hazards (By Type)
vii) Chemical Inventory Information
viii) Storage Codes and Locations
ix) Storage Types
x) Storage Conditions
xi) Certification Signature/Date

3. Annually, by July 1, FLUs must file a Form R "Toxic Chemical Release Inventory Reporting Form," *if* they were classified under SIC codes 20 through 39, had 10 or more employees, *and* used 10,000 pounds or more of a listed FL during the year.

a) A Form R report uses an EPA specified form and must be sent to:
   i) Tennessee Emergency Management Agency
      3401 Sidco Drive
      Nashville, TN 37204
   ii) EPCRA Reporting Center
      P.O. Box 3348
      Merrifield, VA 22116-3348
      Attn: Toxic Chemical Release Inventory
b) The Form R includes the following information:
   i) Facility Identification Information
   ii) Chemical Specific Information
      1) Toxic Chemical Identity
      2) Mixture Component Identity
      3) Activities and Uses of the Toxic Chemical
      4) Maximum Amount On-site During the Year
      5) Releases to the Environment
      6) Transfers Off-site
      7) On-site Treatment, Methods and Efficiency
      8) On-site Energy Recovery
      9) On-site Recycling Processes
      10) Source Reduction and Recycling Activities

SECTION TWENTY
Hazardous Waste Management
TDEC Chapter 1200-1-11

How Do These Rules Affect FLUs?

Most FLUs generate wastes containing or contaminated with flammable liquids (FLs). TDEC lists most common solvents, when spent, as hazardous wastes. They also define wastes with a flash point below 140°F to be "ignitable characteristic" hazardous wastes.

Hazardous waste management rules compel a waste generator to determine if that waste is a hazardous waste. They also designate a waste to be hazardous if it is "listed" or exhibits any "hazardous characteristic" and it has not been excluded from regulation administratively.

What Aspects of Flammable Liquid (FL) Handling Do These Rules Cover?

- Duties specified for those FLUs generating an ignitable or listed spent solvent waste cover its collection, on-site storage, off-site transport, ultimate disposal, and related activities such as employee training, record keeping, waste reduction planning, and reporting. As the rate of waste generation increases, these duties become much more comprehensive.

What Administrative Actions Does This Rule Require a FLU To Take?

1. You must keep records to document any analysis, MSDS review, or other effort made to properly classify a waste for at least three years after the waste last was sent to an on-site or off-site treatment, storage, or disposal facility.
2. FLU's generating ignitable characteristic or listed spent solvent wastes must determine the quantity of these and all other hazardous wastes generated each month. They also must determine relevant "Hazardous Waste Code(s)" for use in identifying each waste. Then they must adhere to rules applied in accordance with a rate-based classification. The three hazardous waste generator classifications follow:
   a) *Conditionally Exempt Small Quantity Generator* (CESQG) - generate no more than 2.2 pounds of acutely-hazardous waste, or no more than 220 pounds of hazardous wastes, in any one calendar month.
   b) *Small Quantity Generator* (SQG) - generate no more than 2.2 pounds of acutely-hazardous waste and less than 2200 pounds of hazardous waste in any one calendar month.
   c) *Large Quantity Generator* (LQG) - generate more than 2.2 pounds of acutely-hazardous waste or more than 2200 pounds of hazardous waste in any one calendar month.
3. CESQG's must:
   a) Generate less than 220 pounds of hazardous waste in every calendar month.
   b) Dispose of hazardous wastes in an on-site facility, or ensure its delivery to an approved off-site treatment, storage, or disposal facility.
   c) Never accumulate on-site at any one time more than 2200 pounds of hazardous wastes.

4. SQG's must do the following:
   a) Generate less than 2200 pounds of hazardous waste in every calendar month.
   b) Secure an EPA Identification Number from TDEC.
   c) Submit, by March 1, an "Annual Report" on waste activity for the previous calendar year. TDEC sends forms to all generators with EPA ID numbers at the beginning of the calendar year.
   d) Develop a "Hazardous Waste Reduction Plan" and annually prepare a "Plan Status Report." The plan and the report must be kept on-site and made available for TDEC inspection.
   e) Accumulate on-site no more than 13,200 pounds of hazardous wastes at any time.
   f) Assure containers (drums) used to accumulate hazardous wastes are compatible with the wastes and in good condition; i.e., free of dents, holes, rust, etc.
   g) Mark each container of hazardous waste "Hazardous Waste."
   h) Train persons adding waste to a container to keep it closed except when additions are being made.
   i) Date containers when they become full. *This date is the Accumulation Start Date*. You also may show the date waste first was put into the drum, but that date is not the accumulation start date.
   j) Close full containers tightly and move them from the "Satellite Accumulation Area" to the "Storage Area."
   k) Make weekly inspections of all hazardous waste containers.
   l) Prevent emergency situations and prepare to meet any that occur.
      i) Maintain and operate facilities to minimize the possibility of fire, explosion, and/or unplanned releases.
      ii) Assure adequate aisle space is maintained between containers to allow movement of personnel and control equipment.
      iii) Provide employees pouring, mixing, spreading, or otherwise handling hazardous wastes with an internal alarm or immediate access (visual or voice) contact with another employee.
      iv) Provide fire extinguishers and equipment for fire control, spill control, and decontamination.
      v) Provide internal communication devices (voice or signals) to give immediate emergency instructions to employees.
      vi) Provide a device (telephone) to summons police, fire department, or emergency response teams.
      vii) Test and maintain communications and control equipment to assure its operability in time of emergency.
      viii) Familiarize the local police, fire department, hospitals and response teams with your potential needs during emergency situations.
   m) Provide for coordination of emergencies.
   n) Name an "Emergency Coordinator;" someone either on-site or on-call 24 hours a day.
   o) Post next to the telephone the following information:
      i) The emergency coordinator's name and phone number.
      ii) The location of fire extinguishers, spill control equipment, and fire alarms.
      iii) The fire department number; unless there's a direct alarm.
   p) Train employees to be thoroughly familiar with proper waste handling and emergency procedures relevant to their responsibilities.
   q) Report any spill reaching surface water to the Tennessee Emergency Management Agency (800/262-3300) or the National Response Center (800/424-8802).
   r) Dispose of wastes within the 180 day period beginning with the accumulation start date.

   Note: EPA allows a 270 day period for wastes shipped more than 200 miles.

s) Use only permitted waste transporter, storage, and/or disposal facilities.

Note: They should be able to show you their permits.

t) Use a "Uniform Hazardous Waste Manifest" for all shipments; keeping a copy for three years.

Note: Manifests track hazardous waste from "cradle to grave" and contain information for the transporter in an emergency. An "*Exception Report*" must be filed with TDEC if a signed back copy is not returned within 45 days from the facility designated to receive the waste.

u) Package, label, and mark the waste containers in accordance with DOT regulations before transporting them. This marking includes your name, address, and manifest number.

Note: If the transporter fails to provide the appropriate placard, you must placard or offer the placards.

5. LQG's must do the following:
   a) Secure an EPA Identification Number
   b) Submit, by March 1, an "Annual Report" on waste activity for the previous calendar year. TDEC sends forms to all generators with EPA ID numbers at the beginning of the calendar year.
   c) Develop a "Hazardous Waste Reduction Plan" and annually prepare a "Plan Status Report." The plan and the report must be kept on-site and made available for TDEC inspection.
   d) Assure containers (drums) used to accumulate hazardous wastes are compatible with the wastes and in good condition; i.e., free of dents, holes, rust, etc.
   e) Mark each container of hazardous waste "Hazardous Waste."
   f) Train persons adding waste to a container to keep it closed except when additions are being made.
   g) Date containers when they become full. *This date is the Accumulation Start Date*. You also may show the date waste first was put into the drum, but that date is not the accumulation start date.
   h) Close full containers tightly and move them from the "Satellite Accumulation Area" to the "Storage Area."
   i) Make weekly inspections of the containers and the storage area.
   j) Train personnel handling hazardous wastes in emergency response, hazardous waste management, and hazardous waste contingency plan implementation. The training must include, where applicable:
      i) Emergency equipment use, inspection, and repair procedures.
      ii) Alarm systems.
      iii) Response to fires or explosions.
      iv) Response to ground water contamination.
      v) Shutdown of operations.
      vi) Contingency plans.
   k) Maintain documentation demonstrating employee classroom or on-the-job training.
      i) Records of former employees must be kept three years from the last day of employment.
      ii) Records of current employees must be kept until facility closure.
      iii) Documents must show:
         - Title and name of each employee filling a hazardous waste position, plus a written job description giving requisite qualifications and assigned duties.
         - Records demonstrating the training.

l) Prepare a "Hazardous Waste Emergency Contingency Plan." Keep a copy at the facility. Send a copy to all local agencies that may be called upon to provide emergency services. UT-CIS's publication "Industrial Issues," which provides guidance on the elements of this plan, is available upon request. Basically, the plan includes the following:
   i) A description of the actions personnel must take in response to an emergency situation.
   ii) A description of arrangements made with local agencies likely to be called in an emergency.
   iii) A up-to-date listing of all personnel qualified to act as an emergency coordinator for the facility; including addresses and phone numbers.
   iv) A list of all emergency equipment, alarms, etc. kept at the facility; including a physical description of each item and its location.
   v) An evacuation plan for all facility personnel, including the alarm signals, alternative routes, etc.

m) Prevent emergency situations and prepare to meet any that occur.
   i) Maintain and operate facilities to minimize the possibility of fire, explosion, and/or unplanned releases.
   ii) Assure adequate aisle space is maintained between containers to allow movement of personnel and control equipment.
   iii) Provide employees pouring, mixing, spreading, or otherwise handling hazardous wastes with an internal alarm or immediate access (visual or voice) contact with another employee.
   iv) Provide fire extinguishers, and equipment for fire control, spill control, and decontamination.
   v) Provide internal communication devices (voice or alarm signals) capable of giving immediate emergency instructions to employees.
   vi) Provide a device (telephone) to summons police, fire department, or emergency response teams.
   vii) Test and maintain communications and control equipment to assure its operability in time of emergency.
   viii) Familiarize the local police, fire department, hospitals and response teams with your potential needs during emergency situations.

n) Provide for coordination of emergencies.
   i) Name an "Emergency Coordinator;" someone either on-site or on-call 24 hours a day.

Note: Duties of an LQG's Emergency Coordinator and the LQG are quite comprehensive during and subsequent to an emergency event.
   ii) Post next to the telephone the following information:
   iii) The emergency coordinator's name and phone number.
   iv) The location of fire extinguishers, spill control equipment, and fire alarms.
   v) The fire department number; unless there's a direct alarm.
   vi) Train employees to be thoroughly familiar with proper waste handling and emergency procedures relevant to their responsibilities.
   vii) Report any spill reaching surface water to the Tennessee Emergency Management Agency (800/262-3300) or the National Response Center (800/424-8802).

o) Dispose of wastes within the 90 day period beginning with the accumulation start date.

Note: Upon request, TDEC can grant a 30 day extension for unforeseen circumstances.

p) Use only permitted waste transporter, storage, and/or disposal facilities.

Note: They should be able to show you their permits.

q) Use a "Uniform Hazardous Waste Manifest" for all shipments; keeping a copy for three years.

Note: Manifests track hazardous waste from "cradle to grave" and contain information for the transporter in an emergency. An "*Exception Report*" must be filed with TDEC if a signed back copy is not returned within 45 days from the facility designated to receive the waste.

r) Package, label, and mark the waste containers in accordance with DOT regulations before transporting them. This marking includes your name, address, and manifest number.

Note: If the transporter fails to provide the appropriate placard, you must provide it.

6. Pay Annual Hazardous Waste Generator fees.
   a) Tennessee requires you to pay annually two separate fees.
      i) Chapter 1200-1-11-.08(5), requires generators to pay a fee on or before March 1st, to the Tennessee Environmental Protection Fund. The amount of the fee depends on the generators' rate classification. Unless they also transport, treat, or dispose of wastes, LQG's pay $900, SQG's pay $550, and CESQG's pay nothing.
      ii) Chapter 1200-1-13-.03, requires generators to pay a fee on or before October 15th to the Hazardous Waste Remedial Action Fund. The fee amount depends on the amount of hazardous waste generated and shipped off-site for treatment. All generators must prepare and return to TDEC a "Fee Worksheet" even if, as CESQG's, they owe no fee. The maximum fee for an LQG is $72,000. An SQG's maximum fee is about $1,000.

INTERNET RESOURCES
List of URLs

The following internet resources may provide useful information:

1. Federal Occupational Safety and Health Administration (OSHA)
   http://www.osha.gov
2. National Institute of Safety and Health (NIOSH)
   http://www.cdc.gov/niosh/homepage.html
3. OSHA Salt Lake Technical Center (Federal Register and OSHA regulations)
   http://www.osha-slc.gov
4. Periodic Table, Constants, Weights and Measures
   http://www.inuit.phys.ualberta.ca/masses.html
5. Safety Online
   http://www.safetyonline.net
6. Environmental Health Center/National Safety Council
   http://envirolink.org/
7. Index of Occupational Safety & Health Resources on the Internet
   http://turva.me.tut.fi/~oshweb/
8. Chemical Safety Information (Dept. of Energy)
   http://tis.eh.doe.gov
9. FireNet
   http://www.firenet.net/
10. Tennessee Department of Environment and Conservation (TDEC)
    http://www.state.tn.us/environment/
11. Government Printing Office (for CFR access)
    http://www.access.gpo.gov/su_docs/aces/aaces002.html

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